

Remarks

Applicant has reviewed the Office Action dated as mailed February 6, 2007, and the documents cited therewith. After the above amendments, the present application contains claims 1-22, 24-42, 52, 54-64, and 66-70. Claims 1, 2, 12, 20, 30, 52, and 61 have been amended. Claims 23, 53, and 65 have been canceled. Claims 43-51 have been withdrawn.

Election/Restrictions

The claims were subject to a restriction requirement to one of the following groups of claims under 35 U.S.C. §121:

- I. Claims 1-42 and 52-70 drawn to a system for testing integrated circuits on a wafer 4.
- II. Claim 43-46 drawn to the structure of a transceiver.
- III. Claims 47-51 drawn to the structure of an antenna system.

Applicant hereby affirms election of Group I (claims 1-42 and 52-70) for further prosecution. Claims 43-51 have been withdrawn without prejudice with respect to filing a divisional application.

Claim Rejections under 35 U.S.C. §112

Claims 1-22, 24-42, 51-52, 54-64 and 66-70 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant's attorney wishes to thank the Examiner for indicating an example of claim language to correct the informality. As suggested by the Examiner, claims 1, 30, 52 and 61 have been amended to more particularly point out and distinctly claim the subject matter of the present invention. Reconsideration and withdrawal of the Section 112 rejection of claims 1-22, 24-42, 52, 54-64, and 66-70 is respectfully requested.

Claim Rejections under 35 U.S.C. §103

Claims 1-6 were rejected under 35 U.S.C. §103(a) as being obvious under Kraz (U.S. Patent Pub. No.: US 2003/0001582; hereinafter “Kraz”) and further in view of Farnworth et al. (U.S. Patent 6,424,168; hereinafter “Farnworth”). This rejection is respectfully traversed. Claim 1 has been amended to recite:

“a transceiver formed on the wafer, wherein the transceiver is formed in one of a scribe line formed in the wafer or on an otherwise unusable portion of the wafer to permit testing of the integrated circuits during various stages of a manufacturing process and before separation of the individual integrated circuits and to avoid using any area of the wafer useable to form an integrated circuit...”

In contrast, Kraz in paragraph [0023], lines 10-21 recites:

“For ease of explanation, the following description will focus specifically on processes and environmental parameter associated with reticles used in a semiconductor fabrication process. The processes monitored include, but are not limited to, retrieval of reticles from storage area, loading the reticles into steppers, and scanning the reticles in a photolithographic process. The parameters monitored include, but are not limited to, a reticle serial number, process tracking information, presence of electrostatic fields, magnitude of electrostatic fields, polarity of electrostatic discharges and magnitude of electrostatic discharges.”

In paragraph [0003], lines 1-5, Kraz teaches:

“A reticle in a semiconductor manufacturing process is a specially made photo “negative” used to expose a photosensitized semiconductor wafer prior to etching in order to ultimately produce a plurality of integrated circuits (IC) on the semiconductor wafer.”

Accordingly, Kraz teaches monitoring environmental parameters associated with a reticle and particularly Kraz is concerned with monitoring electrostatic discharge (ESD) damage to the reticle. Kraz does not teach or suggest testing integrated circuits on a wafer as provided by the embodiments of the present invention as recited in the claims.

Farnworth teaches a reduced terminal testing system. Farnworth referring to Figure 2A recites in column 6, lines 45-55:

“Probe pads 26, 28, 30, 32, 34, and 36 (collectively “probe pads 26-36”) are formed on substrate 14. Because the size of dice 18-22 is exaggerated with respect to the size of wafer 10 and probe pads 26-36, the optimal placement of probe pads 26-36 is not shown. However, probe pads 26-36 should be positioned such that the total number of dice on wafer 10 is either not reduced at all or reduced only by a minimum due to the presence of probe pads 26-36. Such placement may be along the edge of wafer 10 where there is unused space caused by the round shape of wafer 10 and the non-round shape of the dice.”

Accordingly, Farnworth teaches the use of probe pads to test integrated circuits on a wafer and does not teach or suggest a transceiver formed on a wafer for testing the integrated circuits during various stages of a manufacturing process as provided by the embodiment of the present invention as recited in amended claim 1. Additionally, there is no teaching or suggestion how the reticle and reticle monitoring apparatus of Kraz would be combined so as to provide the embodiments of the present invention as recited in the claims. Applicant respectfully submits that a person of ordinary skill in the art would not be motivated to combine the teachings of Kraz and Farnworth because Kraz, as discussed above, is concerned with monitoring ESD damage to a reticle and not IC testing on a wafer, and Farnworth teaches the use of probe pads for testing ICs on a wafer. Even if it were proper to combine the teachings of Kraz and Farnworth, they still would not provide the present invention as recited in the claims. In contrast to the features of claim 1 recited above, Kraz in paragraph [0024] recites:

“FIG. 1 illustrates an example of a device in accordance with the invention that is attached to a product in the process of being manufactured or otherwise processed. In particular, a reticle 10 with a pellicle (a protective clear film) 12 is used in photolithography process as described above and as is well known. A logging device 14 in accordance with the invention is attached to the reticle 10 in a fashion that does not impede the processing of the reticle. Similarly, the logging device 14 may be attached to any object in a non-invasive fashion wherein the object is moving through a manufacturing process.”

And referring to Figure 3, in a paragraph [0030], lines 5-11 Kraz recites:

“In a preferred embodiment, the data logging unit 36 embodies a battery 42, sensors 37, a signal processing circuit 38, a data logger 39, a RF transmit/receive circuit 40, and an antenna 41 in a linear arrangement so that the whole unit 36 can be enclosed in a small unobtrusive package and fit on the side of the reticle 10 as illustrated in FIG. 1.”

Thus, Kraz teaches that the data logging device 14 is attached to the side of the Reticle 10. Kraz does not teach or suggest a transceiver formed on the wafer nor does Kraz teach or suggest that the transceiver is formed in one of a scribe line formed in the wafer or on an otherwise unusable portion of the wafer to permit testing of the integrated circuits during various stages of a manufacturing process and before separation of the individual integrated circuits and to avoid using any area of the wafer usable to form an integrated circuit as recited in the embodiment of the invention recited in claim 1.

As previously discussed, Farnworth teaches the use of probe pads to test integrated circuits on a wafer and also does not teach or suggest a transceiver formed on the wafer nor does Farnworth teach or suggest that the transceiver is formed in one of a scribe line formed in the wafer or on an otherwise unusable portion of the wafer as provided by the embodiment of the present invention as recited in independent claim 1.

For all of the reasons discussed above, claim 1 is respectfully submitted to be patentably distinguishable over Kraz and Farnworth, whether considered individually or combined, and reconsideration and withdrawal of the 35 U.S.C. §103 rejection of independent claim 1 is respectfully requested.

With respect to the rejection of claims 2-6 under 35 U.S.C. §103(a) as being obvious under Kraz and in further view of Farnworth, claim 2-6 recite additional features which further patentably distinguish over Kraz and Farnworth. For example, claim 2 recites: “the transceiver is able to couple to a plurality of integrated circuits formed on the wafer to test selected ones of the plurality of integrated circuits.” Claim 5 recites: “a multiplexing circuit to couple the transceiver to each of the plurality of integrated circuits.” Claim 6 recites: “wherein the antenna system comprises one of a loop antenna, a pair of dipole antennas or an antenna array formed by loop or dipole antenna elements.” Applicant respectfully submits that none of these features of the embodiments of the present invention recited in claims 2-6 are taught or suggested by Kraz or Farnworth. Additionally, claims 2-6 depend either directly or indirectly from independent claim

1. Because of this dependency, claims 2-6 contain all of the features of independent claim 1. Accordingly, claims 2-6 are also submitted to be patentably distinguishable over Kraz and Farnworth, and reconsideration and withdrawal of the Section 103 rejection of claims 2-6 is respectfully solicited.

Regarding the rejection of claims 7-20 under 35 U.S.C. §103(a) as being obvious under Kraz and in further view of Farnworth, claims 7-20 recite either similar features to claims 2-6 or recite additional features which further patentably distinguish over Kraz and Farnworth. Additionally, claims 7-20 depend either directly or indirectly from independent claim 1, and by virtue of that dependency, contain all of the features of independent claim 1. Therefore, claims 7-20 are also submitted to be patentably distinguishable over Kraz and Farnworth, and reconsideration and withdrawal of the 35 U.S.C. §103 rejection of claims 7-20 is respectfully solicited.

Regarding the rejection of claim 21 under 35 U.S.C. §103(a) as being obvious under Kraz in view of Farnworth, claim 21 recites:

“a down converter to convert a received radio frequency (RF) signal to an intermediate frequency (IF) signal;
a received signal strength indicator (RSSI);
a limiting amplifier to amplify the IF signal in response to the RSSI; and
a comparator to generate a data signal in response to the amplified IF signal.”

In contrast, Kraz in Figure 3 and paragraph [0030] as recited above, merely teaches that the data logging unit 36 embodies a battery 42, sensors 37, a signal processing circuit 38, a data logger 39, and an RF transmit/receive circuit 40, and an antenna 41. Kraz does not teach or suggest the features of the embodiment of the present invention as recited in claim 21 above. Additionally, claim 21 depends directly from independent claim 1, and by virtue of that dependency, contains all of the features of claim 1. As previously discussed, independent claim 1 is patentably distinguishable over Kraz and Farnworth. Therefore, claim 21 is also submitted to be patentably distinguishable over Kraz and Farnworth, and reconsideration and withdrawal of the Section 103 rejection of claim 21 is respectfully requested.

Regarding the rejection of claim 22 under 35 U.S.C. §103(a) as being obvious in view of Kraz and in further view of Farnworth, claim 22 recites:

“a phase/frequency detector to receive an input or reference signal;

a charge pump to receive an output signal from the phase/frequency detector;
a filter to filter selected frequency band signals from a charge pump signal;
a voltage controlled oscillator to receive a filtered signal from the filter; and
a power amplifier to modulate a carrier signal from the voltage controlled oscillator by a data input signal.”

In contrast, as previously described, Farnworth in paragraph [0030] merely teaches that his data logging unit 36 embodies a battery 42, sensors 37, a signal processing circuit 38, a data logger 39, and RF transmit/receive circuit 40, and an antenna 41. Applicant respectfully submits that neither Farnworth nor Kraz teach or suggest the features of the present invention as recited in claim 22.

Applicant respectfully submits that a prima facie case obviousness has not been properly established under M.P.E.P. §706.02(j). Applicant disagrees with the assertion in the Office Action that claim 22 recites the basic structure of a transceiver and requests that a reference teaching the features of claim 22 be cited and properly combined with Kraz and/or Farnworth to establish a prima facie case of obviousness under the M.P.E.P. and so that Applicant can properly and effectively respond to any rejection based on such reference. Otherwise, the rejection should be withdrawn.

Furthermore, claim 22 depends directly from independent claim 1. As a result of this dependency, claim 22 includes all of the features of independent claim 1. For all of these reasons, claim 22 is respectfully submitted to be patentably distinguishable over Kraz and Farnworth, and reconsideration and withdrawal of the 35 U.S.C. §103 rejection of claim 22 is respectfully requested.

Turning now to the rejection of claims 24-29 under 35 U.S.C. §103(a) as being obvious in view of Kraz and in further view of Farnworth, these claims recite additional features that are neither taught nor suggested by either Kraz or Farnworth. For example, claim 25 recites:

“a loop antenna adapted to be shared by a plurality of transceivers; and
a plurality of differential amplifier circuits, each differential amplifier circuit being associated with one of the plurality of transceivers, wherein only one of the plurality of differential amplifier circuits is active at any given time to permit the associated transceiver to receive or transmit signals.”

Claim 26 recites:

“wherein the antenna system further comprises an inductor connected in parallel with each differential amplifier circuit, wherein the inductor completes the loop antenna when an associated differential amplifier circuit is disabled.”

Claim 27 recites:

“a pair of inductors connected in parallel with each differential amplifier circuit, wherein the pair of inductors complete the loop antenna when an associated differential amplifier circuit is disabled; and
a field effect transistor (FET) to couple a voltage source to a node between each pair of inductors, wherein the voltage source is connected to the node in response to an RF carrier signal from an associated one of the plurality of transceivers being applied to a gate of the FET.”

Claim 29 recites:

“an insulative layer formed on the wafer; and
a conductive layer formed on the insulative layer and electrically connecting to the transceiver via an opening formed in the insulative layer to test selected ones of the integrated circuits during manufacturing, wherein the insulative layer and the conductive layer are removable for further fabrication of the integrated circuits.”

Applicant respectfully submits that the features recited in claims 24-29 are not taught or suggested by either Kraz or Farnworth. Additionally, Applicant respectfully submits that a prima facie case obviousness has not been properly established under M.P.E.P §706.02(j). Applicant disagrees with the assertion in the Office Action that the features recited in claims 24-29 are basic structure of an antenna system and requests that a reference be cited to support this assertion and to properly establish a prima facie case of obviousness under the M.P.E.P.

Additionally, claims 24-29 depend either directly or indirectly from independent claim 1. Because of this dependency, claims 24-29 include all of the features of independent claim 1. For all of these reasons, claims 24-29 are submitted to be patentably distinguishable over Kraz and Farnworth, whether considered individually or combined, and reconsideration and withdrawal of the 35 U.S.C. §103 rejection of claims 24-29 is respectfully solicited.

Turning now to the rejection of independent claim 31 under 35 U.S.C. §103(a) as being obvious in view of Kraz and further in view of Farnworth, claim 30 recites similar features to independent claim 1. Accordingly, claim 30 is submitted to be patentably distinguishable over

Kraz and Farnworth for the same reasons as discussed with respect to independent claim 1. Reconsideration and withdrawal of the Section 103 rejection of independent claim 30, is therefore, respectfully solicited.

With respect to the rejection of claims 31-42 under 35 U.S.C. §103(a) as being obvious in view of Kraz and in further view of Farnworth, these claims recite similar features to claims 2-22 and 24-29. Additionally, claims 31-42 depend either directly or indirectly from independent claim 30, and by virtue of that dependency, contain all of the features of independent claim 30. Therefore, claims 31-42 are also submitted to be patentably distinguishable over Kraz and Farnworth, and reconsideration and withdrawal of the 35 U.S.C. §103 rejection of these claims is respectfully solicited.

With respect to the rejection of independent claim 52 under 35 U.S.C. §103(a) as being obvious in view of Kraz and further in view of Farnworth, claim 52 recites similar features to independent claim 1. Therefore, claim 52 is submitted to be patentably distinguishable over Kraz and Farnworth for the same reasons as discussed with respect to independent claim 1.

With respect to the rejection of claims 54-60, these claims recite features similar to claims 2-22 and 24-29. Additionally, claims 54-60 depend either directly or indirectly from independent claim 52. As a result of this dependency, claims 54-60 include all of the features of independent claim 52. Therefore, claims 54-60 are also submitted to be patentably distinguishable over Kraz and Farnworth, and reconsideration and withdrawal of the Section 103 rejection of these claims is respectfully solicited.

Regarding the rejection of independent claim 61 under 35 U.S.C. §103(a) as being obvious in view of Kraz and in further view of Farnworth, claim 61 also recites similar features to independent claim 1. Therefore, claim 61 is submitted to be patentably distinguishable over Kraz and Farnworth for the same reasons as discussed with respect to independent claim 1. Reconsideration and withdrawal of the Section 103 rejection of claim 61 is respectfully requested.

With regard to the rejection of claims 62-64 and 66-70, these claims recite additional features which further patentably distinguish over Kraz and Farnworth. Additionally, these claims depend either directly or indirectly from independent claim 61, and by virtue of that dependency, contain all of the features of claim 61. Claims 62-64 and 66-70 are, therefore,

submitted to be patentably distinguishable over Kraz and Farnworth, and reconsideration and withdrawal of the Section 103 rejection of these claims is respectfully solicited.

Conclusion

For the foregoing reasons, the Applicant respectfully submits that all of the claims in the present application are in condition for allowance. Reconsideration and withdrawal of the rejections and allowance of the claims at the earliest possible date are respectfully requested.

If the Examiner has any questions about the present Amendment or anticipates finally rejecting any claim of the present application, a telephone interview is requested.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 13-4365.

Respectfully submitted,

Lawrence Pileggi
(Applicant)

Date: June 6, 2007

By: Charles L. Moore

Charles L. Moore
Registration No. 33,742
Moore & Van Allen
P.O. Box 13706
Research Triangle Park, N.C. 27709
Telephone: (919) 286-8000
Facsimile: (919) 286-8199